

INTER-AMERICAN TROPICAL TUNA COMMISSION

SCIENTIFIC ADVISORY COMMITTEE

11TH MEETING

(By videoconference)

26-28 October 2020

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AGENDA (FOCUSED)

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2. Adoption of agenda and schedule of the meeting sessions	
3. Tropical tuna species: Yellowfin, bigeye and skipjack	
a. Summarized presentation on the status of the stocks and relevant information and data (fishery indicators, stock assessments, and risk analysis)	SAC-11-03 SAC-11-05 SAC-11-06
b. Presentation and discussion of each staff recommendation	SAC-11-07
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1. OPENING OF THE MEETING

The Director *ad interim* of the IATTC and Chairman of the SAC, **Jean-François Pulvenis**, opened the meeting, for which a quorum had been achieved, and welcomed the participants, drawing their attention on the circumstances that made it necessary to hold it by videoconference, at such a late date and under an agenda focused only on the most essential aspects to allow the Commission to discuss and decide upon the conservation and management measures that must be taken before the beginning of the next year. The Chairman also briefly recalled the procedure and the method that would be followed during the meeting in order to optimize the use of time and facilitate the reaching of a consensus, whenever possible.

2. ADOPTION OF AGENDA AND SCHEDULE OF THE MEETING SESSIONS

The provisional agenda (focused) was adopted.

3. TROPICAL TUNA SPECIES: YELLOWFIN, BIGEYE AND SKIPJACK

a. Summarized presentation on the status of the stocks and relevant information and data (fishery indicators, stock assessments, and risk analysis)

Summary:

The management advice for tropical tunas in the eastern Pacific Ocean (EPO) provided to the Commission by the IATTC scientific staff has traditionally been based on a 'best assessment' approach. In 2018 the staff concluded that the results of its stock assessment of bigeye in the EPO were not reliable enough to be used as a basis for management advice to the Commission, and in 2019 extended this conclusion to its assessment of yellowfin ([IATTC-94-03](#)). The assessment issues ([SAC-09 INF B](#); [SAC-10 INF-F](#)) were addressed in the staff's [workplan to improve the stock assessments for tropical tunas](#), which included external reviews of the assessments for [bigeye](#) and [yellowfin](#), and has now been successfully completed.

New benchmark assessments are available for yellowfin and bigeye ([SAC-11-07](#), [SAC-11-06](#)). These assessments represent a fundamental change from the staff's previous 'best assessment' approach: they are the basis for a 'risk analysis', in which a variety of reference models are used to represent plausible alternative hypotheses about the biology of the fish, the productivity of the stocks, and/or the operation of the fisheries, thus effectively incorporating uncertainty into the management advice as it is formulated. The risk analysis for yellowfin and bigeye was used to evaluate several management quantities related to the IATTC's [harvest control rule](#) (HCR) for tropical tunas. In document [SAC-11-08](#), the results are presented separately for each species for the two components of the analysis, *Current stock status* and *Decision analysis*, the latter evaluating the risk of exceeding the target and limit reference points resulting from different durations of the temporal closure of the purse-seine fishery.

This transition to a risk analysis approach is a significant advancement in stock assessment science and the subsequent formulation of management advice for tropical tunas at IATTC. First, the process resulted in the identification of a set of reference models (alternative hypotheses, or '*states of nature*') describes the population dynamics of yellowfin ([SAC-11-07](#)) and bigeye [SAC-11-06](#), as well as the main axes of uncertainty in the stock assessments for both species. Second, the approach provides a methodology for assigning relative weights to the plausibility of alternative hypotheses that takes into consideration a range of factors (*e.g.* expert opinion, model fit, plausibility of results and parameter estimates, and diagnostics) ([SAC-11 INF-F](#)). The final product of the risk analysis is a set of probability statements for exceeding the reference points established in the HCR.

For **yellowfin**, the overall results of the risk analysis, which include all 48 reference models, indicate only a 9% probability that the fishing mortality corresponding to the maximum sustainable yield (F_{MSY}) has been

exceeded. There is a 12% probability that the spawning stock biomass corresponding to the maximum sustainable yield (S_{MSY}) has been breached. The probability that the F and S limit reference points have been exceeded is zero.

For **bigeye**, the overall results of the risk analysis, which include 44¹ reference models, indicate a 50% probability that F_{MSY} has been exceeded and a 53% probability that S_{cur} is below S_{MSY} . The probabilities that the F and S limit reference points have been exceeded are not negligible ($P(F_{cur} > F_{LIMIT}) = 5\%$; $P(S_{cur} < S_{LIMIT}) = 6\%$).

The risk analysis unambiguously shows that the yellowfin stock in the EPO is biologically sustainable, but the results are less clear for bigeye. The bimodal nature of the probability distributions from the bigeye risk analysis for the management quantities of interest indicates that the stock is either well below or well above the levels corresponding to MSY (S_{MSY}). Clearly, optimal management—or even whether the bigeye stock size should be increased or decreased—cannot be determined from the risk analysis. However, the combined probability distribution for the pessimistic models shows only a 10% probability of exceeding F_{LIMIT} for the current EPO-wide closure duration (72 days), indicating that it is unlikely that this limit has been exceeded. Therefore, an extension to the *status quo* harvest strategy should be appropriate in the short term.

The bimodality of the bigeye probability distributions complicates the evaluation of the stock's status and the potential outcomes of management actions. This issue needs to be addressed in the future to improve management advice. There are two avenues towards this goal: 1) continue to improve the stock assessment models, which also involves their data inputs, and 2) develop and evaluate management strategies that are shown to be robust to the main uncertainties, including the bimodality, using Management Strategy Evaluation (MSE), a process that is already ongoing at the IATTC ([MSE Workplan](#) and recent [Workshops](#)). Improving the stock assessment models and their input data should focus on investigating the time spans of the models, assumptions about stock structure, and estimation of growth. Improving estimates of natural mortality and of selectivity for fisheries assumed to have asymptotic selectivity should also be considered. MSE provides a framework for developing management strategies that incorporate, and are robust to, the different forms of unavoidable uncertainties involved in fishery management, thereby providing a formal approach to evaluate management actions designed to achieve fisheries objectives.

4. TEMPERATE TUNA SPECIES: PACIFIC BLUEFIN TUNA AND NORTH PACIFIC ALBACORE

a. Summarized presentations on the status of the stocks and relevant information

Pacific bluefin tuna (ISC stock assessment, presentation by H. Fukuda)

Summary:

Hironu Fukuda presented the results of the [2020 ISC stock assessment of Pacific bluefin tuna](#). The discussion about the assessment and staff recommendations for conservation is provided on section 6 below.

North Pacific albacore (ISC stock assessment, presentation by Steve Teo)

Summary:

Steve Teo presented the results of the [ISC 2020 stock assessment of North Pacific albacore](#). The discussion about the assessment and staff recommendations for conservation is provided on section 6 below.

¹ Four of the 48 models did not converge for bigeye.

5. OTHER URGENT ISSUES

a. Activities of the scientific staff and research program

Document [SAC-11-01a](#) describing the activities of the scientific staff and research program was available to the Members prior to the meeting and was listed as an agenda item, but the SAC did not request the document be discussed.

b. Electronic monitoring (Marlon Roman presented [SAC-11-10](#) on electronic monitoring (EM))

Summary:

The IATTC scientific staff presented a summary of document [SAC-11-10](#) at the request by CPCs to describe the minimum standards in the implementation of an electronic monitoring system (EMS) in EPO tuna fisheries based on field trials and in accordance with resolution [C-19-08](#). The objectives of the field trials and general considerations in the implementation of an EMS in the EPO were described, along with the various EMS components that would need to be supported by the SAC and adopted by the Commission in order for the EMS to be successful. Specifically, these components include the institutional structure of the EMS under the IATTC framework; the EM definitions for the implementation of an EMS; the EM management, and the logistical, technical, data collection and data analysis and reporting standards. The efficacy of EM data collected onboard IATTC tuna purse-seine vessels was assessed in a pilot study where catch characteristics were compared to data collected concurrently by IATTC observers on the same vessels (IATTC Project D.2.a). To date, the results are promising in that EM was capable of collecting data pertaining to 79.7% of observer data fields, while completion of the remaining data fields was believed to require additional effort or is not practical or possible to collect. Some limitations were identified such as identification of FADs, and estimation of the biomass and species composition for individual sets. With respect to the implementation of EM in the EPO longline fishery, the minimum standards were recommended based on the results of a concurrent project trialing EM on longline vessels in the western and central Pacific Ocean by the WCPFC. Although in progress, the project has demonstrated that EM has collected 85.2% of observer data fields, with the remaining data fields, as for EPO purse-seine, require additional effort to fulfill, or is not practical or possible to collect.

Discussion:

- Several members (the **European Union, United States, Costa Rica, Nicaragua**) and organizations (**ISSF, Pew**) were impressed with the amount of work done by the staff, especially given the difficulties caused by the COVID-19 pandemic.
- **Nicaragua** was encouraged by the high percentage of observer data fields that could be collected by EM.
- The **European Union** noted that the minimum standards do not have to be final and can be adopted temporarily, while continuing to improve them in future. These standards should be considered by the Commission at the 2020 Annual Meeting.
- **ISSF** suggested adoption of minimum standards be made a priority as other RFMOs have done, and noted that ISSF have produced a relevant document for consideration ([SAC-11 INF G REV](#)).
- **Costa Rica** suggested a proposal for temporary minimum standards for longline be presented at SAC-12.
- The **United States** proposed that the staff organize a workshop prior to SAC-12 to review the details of the EM project that was presented because of the complexity of the material and short timeframe

of the virtual SAC-11 meeting. It was proposed that the workshop participants should include IATTC members, other stakeholders, and EM experts.

- **Alexandre Aires-da-Silva** commented that holding a meeting or workshop is expensive and that a funding proposal should be the first task. **Pew** offered funding for the EM workshop if it took place in early 2021. The **European Union** noted that if the workshop was virtual it would be less expensive, allowing more experts to attend.
- **Costa Rica** offered vessels to participate in the pilot EM project focusing on longline vessels.
- **Nicaragua** noted that while EM appears to be a solution for many data collection needs, both observers and EM are required for data collection. Human observers can use their time for other high priority tasks. In addition, the EM system can be used to look at nighttime activities (e.g. FAD deployments) when observers are asleep.
- **Pew Charitable Trusts** acknowledged that the COVID-19 pandemic revealed unforeseen challenges in the ability to conduct important independent data collection and monitoring of tuna fisheries across the IATTC Convention Area, further highlighting the urgent need for electronic monitoring (EM). During the 2020 SAC meeting, there was positive discussion on EM, including a comprehensive presentation from the Scientific Staff and draft recommendations from the US and Central America. Unfortunately, time constraints prevented these recommendations from being considered, and instead, the **Chair** noted the support to continue the Scientific Staff's work to develop an EM program. **Pew** is encouraged that the work of the Scientific Staff will continue and looks forward to more discussion at the Commission meeting.
- **Pew Charitable Trusts** supported the idea that the Scientific Staff host an EM workshop—as recommended by the **United States**—to develop minimum standards to be presented to the 2021 SAC and Commission meeting.

6. SAC RECOMMENDATIONS TO THE COMMISSION

6.1 Recapitulation of the SAC recommendations as previously discussed and consolidated, and its revision and adoption by consensus

TROPICAL TUNAS

Resumen:

Recommendation: Duration of the temporal closure of the purse-seine fishery

The primary conservation measure for tropical tunas in the EPO is the temporal closure of the purse-seine fishery (currently 72 days) either during July–October or November–January ([Resolution C-17-02](#)). In order to evaluate the potential consequences of different closure durations, the staff conducted a risk analysis ([SAC-11-08](#)), which quantified the probability (risk) of exceeding the reference points specified in the harvest control rules for tropical tunas in the EPO established in [Resolution C-16-02](#).

Paragraph 3a of [Resolution C-16-02](#) specifies that *“the scientific recommendations for establishing management measures in the fisheries for tropical tunas, such as closures, which can be established for multiple years, shall attempt to prevent the fishing mortality rate (F) from exceeding the best estimate of the rate corresponding to the maximum sustainable yield (F_{MSY}) for the species that requires the strictest management.”*

The staff's determination about whether the duration of the closure needs to change is based on the

overall results² of the risk analysis for bigeye, which requires the strictest management of the three principal tropical tuna species. The overall results (Figure 2, [SAC-11-08](#)) take into account 44 reference models (alternative hypotheses) and their assigned relative weights in the combined distributions for the management parameters.

In 2020, the staff is not recommending changes in the number of closure days, for two reasons.

1. The overall results of the risk analysis indicate a 50% probability that F_{MSY} has been exceeded, and a 53% probability that S_{cur} is below S_{MSY} . Although [Resolution C-16-02](#) does not specify the acceptable level of probability of exceeding the target reference points, these probabilities are at about a reasonable arbitrary reference level of 50%, considering that, at F_{MSY} , S will fluctuate around the target reference point (S_{MSY}) due to interannual recruitment fluctuations. F will also fluctuate around the target reference point (F_{MSY}) due to interannual fluctuations in catchability and distribution of purse-seine effort among set types.
2. The overall results of the risk analysis for **bigeye** indicate that, although the probabilities that the F and S limit reference points have been exceeded are not negligible ($P(F_{cur} > F_{LIMIT}) = 5\%$; $P(S_{cur} < S_{LIMIT}) = 6\%$), they are below the 10% threshold for triggering an action specified in [Resolution C-16-02](#).

Additional precautionary measures to prevent further increases in fishing mortality

As mentioned above, the staff based its determination that no changes are needed in the current duration of the temporal closure of the purse-seine fishery on the overall results of the risk analysis for bigeye. However, the distribution of the management quantities for bigeye is bimodal (Figures 7-10, [SAC-11-08](#)), with marked differences in the management quantities estimated by two distinct groups of models (the ‘pessimistic’ and ‘optimistic’ states), unlike the unimodal distribution of **yellowfin** (Figures 1-4, [SAC-11-08](#)). This bimodal pattern indicates that the stock is either well below or well above the target reference points (Figure 14, [SAC-11-08](#)), and the staff urges caution in interpreting these results for management purposes. The duration of the closure is based on the average of all models—pessimistic and optimistic—but the possibility that either the pessimistic or the optimistic scenario reflects reality needs to be considered. In particular, if the pessimistic scenario is correct, the probability of exceeding the limit reference points with the current closure is 10%, or slightly higher (Figure 15, [SAC-11-08](#)).

As noted above, the staff also considered stock status indicators (SSIs; [SAC-11-05](#)) in the formulation of its management advice for tropical tunas.

For precautionary reasons, the staff is recommending that fishing mortality (F) not be increased beyond current levels (*status quo*), for three reasons:

- a. If the pessimistic scenario from the **bigeye** risk analysis ([SAC-11-08](#)) reflects the true state of nature, the probability that the limit reference points are being breached is 10%, or slightly higher.
- b. Most stock status indicators based on the floating-object fishery suggest that the fishing mortality has increased, mainly due to the increase in the number of floating-object sets.
- c. Given the lack of a stock assessment or an evaluated harvest strategy for **skipjack**, fishing mortality should not be increased beyond current levels

The staff is recommending additional precautionary measures to ensure that the *status quo* fishing

² The “overall results” of the risk analysis include the results of all the models (hypotheses) used in the analysis, and are obtained by computing the weighted average of the combined probability distributions of the management quantities.

mortality is not exceeded (see Document [SAC-11 INF-M](#)). The following four options, all directly applicable to controlling F , and/or already implemented in some form, were investigated:

1. limiting the number of floating-object (OBJ) sets;
2. adjusting the limits on daily active FADs;
3. limiting FAD deployments; and/or
4. adjusting the duration of the closure to compensate for increases in OBJ sets.

The staff reviewed the advantages and disadvantages of each option, as well as potential solutions to disadvantages (see Document [SAC-11 INF-M](#)). The staff weighed the management benefits against data and infrastructure shortcomings, which led to the conclusion that a limit on floating-object sets for all purse-seine vessels, combined with individual-vessel daily active FAD limits, would be the most appropriate option for preventing an increase in F within a management cycle. How the limit on the number of floating-object sets would be allocated among CPCs or among vessels, or by some other arrangement, is a matter for the Commission to decide.

Triennial management cycle

SAC-10 Recommendation 1.b states:

“The SAC recognizes that the current schedule of annual benchmark or update assessments of bigeye and yellowfin tunas makes it difficult for the IATTC staff to perform the necessary research to improve those assessments, as well as to develop assessments for other stocks requested by the Commission. Indicators are available every year to make any needed adjustments.

Therefore, the SAC recommends that the IATTC staff develop, and present to the SAC, an alternative assessment schedule, with benchmark or update assessments scheduled in coordination with the management schedule, and indicator analyses in the intervening years to assess whether additional management measures are required.”

The staff is recommending a triennial management cycle (2021–2023) for the new measures, for the following reasons:

- a. Conducting annual risk analyses is an inefficient use of staff time; a three-year management cycle would increase the time available to improve existing assessments and the risk analysis, develop assessments for other stocks, and particularly to focus on the [ongoing MSE process](#);
- b. Stock status indicators, computed annually, can be used as a basis for any needed adjustments within the management cycle;
- c. Major changes in the management recommendations are unlikely within the management cycle, since this would require substantial new data, research and improvements in the assessments and risk analysis.
- d. The Scientific Advisory Committee supports transitioning to a multi-year assessment cycle.

Management advice

Based on the above, in 2020 the staff makes the following recommendations for the conservation of tropical tunas:

RECOMMENDATIONS:

1. Establish a triennial management cycle for the tropical tuna fishery in the EPO (2021–2023).
2. Maintain the provisions of the current resolution ([C-17-02](#)), except paragraph 8.

3. Establish an annual limit for all purse-seine vessels on the total number on floating-object sets³, combined with individual-vessel daily active FAD limits⁴.

Presentation and discussion of each staff recommendation and, as appropriate, its adoption

Recommendation 1: Establish a triennial management cycle for the tropical tuna fishery in the EPO (2021–2023).

- There was support (**Ecuador, Mexico, Japan, USA, Nicaragua**) for the recommended 3-year management cycle, but concern expressed by **Japan** that there needed to be the option to adjust management measures, if necessary, and to request additional analyses by the staff—beyond the stock status indicators—if necessary. **Alexandre Aires-da-Silva** confirmed that this was the intention and that this would be accomplished each year through evaluation of stock status indicators.
- The start date of the 3-year cycle was discussed. **Ecuador** and **the European Union** suggested delaying commencement until 2022.
- **The European Union** suggested that instead of postponing both **yellowfin** and **bigeye** assessments until 2023, as proposed in the Staff activities plan, a **bigeye** and **yellowfin** assessments could be undertaken in 2021 and 2022, respectively, or vice versa.
- Both the **United States** and **Ecuador** commented that a 3-year management plan be implemented then additional external reviews of the **bigeye** and **yellowfin** stock assessments and the risk assessment approach be undertaken, in addition to a workshop. The **United States** stated that the **yellowfin** stock assessment is not capturing all important sources of uncertainty, in particular spatial structure. The **United States** suggested more model development is needed to prevent having the same suite of models by the end of the 3-year management cycle. **Alexandre Aires-da-Silva** stated that no external model reviews are currently scheduled as the cost of workshops and reviews is high and they represent an increased amount of work for the staff which could rather be spent on research and model improvements. As an alternative, he mentioned it may be possible to complete exploratory assessments in 2022 rather than to complete benchmark assessments and to subsequently solicit feedback and undertake external reviews.
- Stakeholder training on interpretation of the risk assessment approach was suggested by **Costa Rica** to be considered as part of the staff workplan.
- The **United States** expressed concern that consensus on the recommended 3-year plan may not be reached at the IATTC Commission meeting, and if that was the case, asked if the staff had a contingency plan.
- **Alexandre Aires-da-Silva** cautioned against changes to the recommended 3-year plan since it may interfere with the staff's ability to complete the more immediate work required to continue improving the tropical tuna stock assessments, additional to other high priority work activities such as planned stock assessment collaborations on swordfish and South Pacific albacore.

SAC recommendation

³ Equal to the average total number of OBJ sets made by the purse-seine fleet during the most recent three-year period (2017-2019). The annual average during 2017–2019 was 15,987 OBJ sets ([SAC-11-03](#)).

⁴ See [SAC-11 INF-M](#) for details.

- The SAC reached consensus to endorse the implementation of the recommended triennial management cycle, with the start date for the cycle to be determined by the Commission.

Recommendation 2: Maintain the provisions of the current resolution (C-17-02), except paragraph 8.

- There was broad support for maintaining the provisions of resolution [C-17-02](#) until at least 2021, however several participants expressed concern about the language in the revision of paragraphs 8, 9, and 12. The SAC also discussed whether the recommendation should be extended for multiple years.
- **Ecuador** supported measures maintained only for 2021 without modification to operative paragraphs outside of applicable dates until further examination of the assessment models, the stock status indicators and how they should be used, are completed before considering the suggested revisions.

SAC recommendation

- A compromise in language was reached for paragraphs 8, 9, and 12 and a recommendation made that measures defined under C-17-02 be maintained for 2021, and that the provisions be reviewed and updated by the Commission, as appropriate, with a specific reference to the provisions on FADs.

Recommendation 3: Establish an annual limit for all purse-seine vessels on the total number on floating-object sets, combined with individual-vessel daily active FAD limits.

- **China** and **Costa Rica** supported the OBJ set limit proposed by the staff, and more generally, the **United States** expressed the need for the development of additional measures. However, the **United States** and **Colombia** commented that an OBJ set limit may not be the most appropriate measure, and requested the staff include other options for discussion at the Commission meeting.
- The **United States** expressed agreement with the staff's assessment of **bigeye** stock status and the evaluation of the probabilities of reaching the target and limit reference points. However, when considering the bi-modal nature of the assessment, they were concerned that the more pessimistic side of the bimodal curve may better reflect the true status, and therefore considered additional measures are warranted. They suggested that the IATTC staff prepare a set of options for consideration by the Commission. **Alexandre Aires-da-Silva** reminded participants that additional measures for consideration already exist within the papers prepared by the staff for SAC-11. The **Chair** suggested that the **United States** submit language for any formal proposal with respect to additional measures that the staff could evaluate.
- **Ecuador** expressed reservations about the IATTC staff's interpretation of stock status indicators (SSI) for **bigeye** and **yellowfin** and their subsequent use for basing recommendations. They also questioned whether there may be additional indicators that are not currently reported. More generally, they maintained that before any SSI could be used to justify the use of additional measures, they would need a better understanding of how the indicators are used and interpreted by the staff and CPCs and then agreed upon by the Commission as to the threshold values that would trigger the implementation of additional measures, and what those additional measures would be. Consequently, **Ecuador** did not support the use of additional measures based on SSIs for 2021, but instead expressed their preference to maintain the current provisions of C-17-02 while indicators continue to be better defined and improved. They suggested that the necessary work should be formally reflected in the staff's research plan.
- **Alexandre Aires-da-Silva** responded that the staff considered the current indicators are the best available but noted that there may be additional indicators that could be used, although this

would require the cooperation of the Members to make additional fisheries data available (in particular improvements in FAD data provision). Furthermore, the evaluation of the performance of stock status indicators and associated measures would be facilitated by the ongoing tropical tuna Management Strategy Evaluation (MSE) process, such as evaluating empirical Harvest Control Rules (HCRs). The current approach simply uses historical SSI levels and considers levels of potential concern when SSIs exceed historical levels. The staff includes such additional measures as precautionary measures given the high potential for fishing mortality to exceed the status quo conditions if the floating-object fishing effort keeps increasing.

- **Ecuador** reiterated concerns about the use of SSIs to trigger a management response but commented that the risk analysis is a welcomed improvement. However, concerns about the staff's interpretation of status based on SSIs, for example, when the reference points on fishing mortality should be derived from the risk analysis, and not from the SSIs and relationships with fishing mortality. Even if there are increases in the number of sets, other information indicates that CPUE and size trends do not necessarily increase fishing mortality. Interpretation of SSIs to derive management actions is questionable given that the HCR is model-based, using an improved assessment framework. Other aspects of SSIs are not included to interpret them. MSE is the way to avoid ambiguities in the interpretation of SSIs to trigger specific management actions, using predetermined actions with respect to changes in SSIs. **Ecuador** stated that it does not oppose the use of SSI, but recommended they are used in a formal decision framework to avoid conflicting interpretations of SSIs. They also recommended to extend the current measures and evaluate the use of SSIs inside a management procedure approach.
- **Alexandre Aires-da-Silva** stated that nothing in the Antigua Convention prohibits the staff to look at auxiliary information, such as SSIs, to make recommendations if they consider they are warranted. Benchmark assessments and risk analyses are used by the staff to derive recommendations. The staff considers SSIs are warranted given:
 - 1) under the **bigeye** pessimistic case the risk of exceeding limit reference points is 10% or higher,
 - 2) SSIs indicate an increase in fishing mortality, mainly due to an increase in the number of floating object sets (OBJ). Although the relationship may not necessarily be linear, current projects are investigating this relationship, which requires high resolution operational data which is still not fully available to the staff. While this relationship is still uncertain and being investigated with the limited data provided to the staff, precautionary measures are called upon by the Antigua Convention.
 - 3) there is no assessment nor evaluated harvest strategy for skipjack and therefore, fishing mortality should not be allowed to increase for precautionary reasons.
- **The European Union** also expressed support for the staff's recommendations on tropical tunas and their assessment of their status, stating that the existing measures should be maintained, and that additional measures to prevent further increase in fishing mortality are warranted. However, they also expressed reservations over the practical implementation of some measures proposed by the staff. For example, with respect to limiting the total number of OBJ sets, it was not clear how the activities of small vessels without observers could be effectively monitored. The **United States** echoed these concerns. Regarding monitoring of small vessels, **Alexandre Aires-da-Silva** suggested that they could use a protocol similar to the weekly reporting currently used for large vessels, where the number of sets, set type, and estimated catch could be summarized and transmitted to the IATTC and subjected to further analysis and verification by the flag state and IATTC staff.

- Following a request by **Colombia** regarding the impact of missing information on the number of FAD deployments in the staff recommendations and about other possibilities to the 3-year average used for the recommendations, **Jon Lopez** stated that for Class 1–5 purse-seine vessels, a possibility would be to implement a system of weekly reporting similar to that in place for observers on Class 6 vessels. At-sea weekly radio reports that provide basic information regarding weekly activities (e.g. tuna catches) could be evaluated to include information regarding FAD deployments. He also explained that the 3-year averaging window for active FADs would start on 1 January 2018, the earliest date that information is reported to the IATTC. He explained a plausible alternative to account for seasonality may be to use the maximum number of active FADs per month, taking into account the closure periods since fishing operations often change during these times.
- **Colombia** stated that they believe there is a linear correlation between the increase in the number of FAD deployments and the number of OBJ sets that result in a decrease in the catch of tropical tunas and a shift in the size composition of the catch towards smaller fish. They believe this highlights the problems with reporting and compliance with respect to paragraphs 9 and 12 of [C-17-02](#) and consider adjustments are required to those provisions if [C-17-02](#) is maintained for 2021. They committed to submitting suggested text for consideration.
- The SAC discussed new text that reflects **Colombia's** suggestions including the extent to which efforts to limit fishing mortality should be directed toward OBJ sets. Some participants considered that further constraining the number of FAD deployments or the number of OBJ sets would be most appropriate because they viewed the OBJ fishery as the primary source of increasing fishing effort in the EPO and thus, the primary driver behind the increased risks of exceeding fishing mortality targets or limits. **Ecuador** restated that there are many ways to constrain or control effort besides focusing on the OBJ fishery, with their preference being for recommendation language that remained more general in nature.

SAC recommendation

- Consensus was established around the language of recommendations that remained broad and describes the need to explore options for further management actions to limit fishing mortality to appropriate levels, and directing the IATTC staff and the Commission to prioritize such actions based on the best available science.

Recommendations on research on tropical tunas: In collaboration with CPCs and relevant stakeholders, that the IATTC 1) Continue improving stock assessments and risk analysis for tropical tunas, and 2) Continue support for MSE for tropical tunas, following guidelines from C-16-02 and C-19-07

- **Costa Rica** requested stakeholder training on interpretation of the risk assessment approach. The **Chair** stated that training has been suspended during the COVID-19 pandemic, but noted training is a priority, for example the dialogue and training workshops as part of the MSE process. **Alexandre Aires-da-Silva** stated that one MSE workshop was conducted in 2019, funding for a second MSE workshop is still available but currently suspended due to COVID-19. He expressed the importance to discuss the objectives of the second MSE workshop and other subsequent MSE workshops.
- The evaluation of the performance of stock status indicators and associated measures would be workable as part of the ongoing tropical tuna Management Strategy Evaluation (MSE) process, for example evaluating empirical Harvest Control Rules (HCRs). The current approach is simple using

historical SSI levels, considering levels of concern when stock status indicators exceed historical levels and any long-term trends are identified.

- **Ecuador** claimed that the relationship between fishing mortality and SSIs is not clear, for example, when analyses from the stock assessment models show a tendency for the fishing mortality for some age groups to not match the interpretations from the SSIs. They supported the notion that the most appropriate means by which to address SSIs in decision making is through the MSE process.
- Several delegations (the **European Union, Costa Rica, Ecuador, and the United States**) and participants (**Pew**) expressed support for continuation of the MSE process for tropical tunas. However, a concern was raised by **Costa Rica** with respect to required funding to continue the MSE process at the IATTC after 2020.
- **Alexandre Aires-da-Silva** clarified that MSE funds at the IATTC end in December 2020 that include funding for the technical and dialogue/training components. There is a proposal ready for continuation of the MSE work in the [SAC-11-01B](#) attachment as an “unfunded research” proposal.

SAC recommendation

- There was consensus to support improving the risk analysis and continuing the MSE process.

TEMPERATE TUNAS

Presentation and discussion of each staff recommendation and, as appropriate, its adoption

Pacific bluefin tuna

The Pacific bluefin tuna working group of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC) completed a [new benchmark assessment](#) of the species in 2020. Projections in which Resolution [C-18-01](#) was extended into the future predict that, even under a low-recruitment scenario up to the first rebuilding target, the stock will rebuild to the interim rebuilding targets. The optimistic results are due to the above-average 2016 recruitment, which is now better estimated in the stock assessment. Projections predict that catch could be increased while still maintaining a high probability of meeting the rebuilding targets. However, it should be noted that the projections assume that recruitment reverts to average after the first rebuilding target is met.

The assessment includes several catch scenarios, with different increases in catch and different distributions of the catch between small and large fish, which follow the [harvest strategy](#) prepared by the joint t-RFMO working group. In most scenarios, catching larger fish increases the total catch in weight for a given level of rebuilding. The staff considers that the most precautionary approach is to maintain the catch limits and other provisions of Resolution [C-18-01](#) through 2021-2022; however, some increases are possible without posing a danger to the rebuilding of the stock, as described in Resolution [C-18-02](#). If one of the scenarios is chosen as the basis for future catch limits, the choice should take into account both the desired rebuilding rate and the distribution of catch between small and large bluefin.

RECOMMENDATIONS:

1. Extend the provisions of Resolution [C-18-01](#) through 2021-2022;
2. Increased catches based on the scenarios analyzed are possible under the harvest strategy prepared by the joint t-RFMO working group. The choice of catch scenario should take into account the desired rebuilding rate and the distribution of catch between small and large bluefin.

Discussion:

- **Japan** supported the staff's recommendations for Pacific bluefin.
- The **European Union** generally agreed with the staff recommendations and highlighted that the statement "*the staff considers that the most precautionary approach would be to maintain current catches*" should be explicitly included in the recommendations by the SAC.
- **Mexico** noted that a joint IATTC-WCPFC meeting pertaining to conservation and management measures had recently occurred where there was agreement during the meeting's discussion that catch should not be permitted to increase over the next year, but it may be feasible to discuss an increase in catch for the following year. Therefore, **Mexico** suggested that the IATTC staff recommendations should be for one year only.

SAC recommendation

- The SAC approved the first draft SAC recommendation on continuation of existing measures for Pacific bluefin tuna and North Pacific albacore without substantive change, following a couple of edits relating to the nature of the recommendations being given.

North Pacific albacore

A [new benchmark stock assessment](#) was completed in 2020 by the Albacore Working Group (ALBWG) of the International Scientific Committee for Tuna and Tuna-like Species in the North Pacific Ocean (ISC). The spawning biomass was at 46% of the dynamic virgin spawning biomass in 2018, the last year in the assessment, and the fishing mortality during 2015-2017 ($F_{2015-2017}$) is below the level corresponding to the maximum sustainable yield ($F_{2015-2017}/F_{MSY} = 0.60$). Ten-year projections with either constant catch (2013-2017 average, 69,000 t) or constant fishing mortality (at the $F_{2015-2017}$ level) predicted an increase in the female spawning biomass. The Working Group noted that there was no evidence that fishing had reduced the spawning stock biomass below thresholds associated with most potential biomass-based reference points. The Working Group concluded that the north Pacific albacore stock is healthy, and that the productivity was sufficient to sustain recent exploitation levels, assuming average historical recruitment in both the short and the long term.

The Working Group is currently undertaking a Management Strategy Evaluation (MSE) for the North Pacific albacore stock. The first round was reported in March 2019 ([ISC/19/ANNEX/06](#)), and a second round should be completed during 2020. In the context of the MSE process, management and conservation objectives were agreed⁵.

The current conservation and management measures for North Pacific albacore (IATTC Resolutions [C-05-02](#), [C-13-03](#) and [C-18-03](#); also WCPFC [CMM 2005-03](#)) are based on maintaining the fishing effort below the 2002-2004 levels. The effort levels in eastern Pacific Ocean for 2017-2019 are 72% and 69% of those in 2002-2004, for vessel-days and number of vessels, respectively.

Given the relative stability in the biomass and fishing mortality in recent years, and in view of the ongoing MSE,

⁵ The following management objectives for North Pacific albacore tuna were developed in the context of the MSE process, given the overarching objective of maintaining the viability and sustainability of the current North Pacific albacore stock and fisheries, agreed upon in the process:

- Maintain spawning biomass above the limit reference point.
- Maintain total biomass, with reasonable variability, around the historical average depletion of total biomass.
- Maintain harvest ratios by fishery (fraction of fishing impact with respect to SSB) at historical average.
- Maintain catches by fishery above average historical catch.
- If a change in total allowable effort and/or total allowable catch occurs, the rate of change should be relatively gradual.
- Maintain F at the target value with reasonable variability.

the staff considers that the current resolutions should be continued.

RECOMMENDATIONS:

1. CPCs should continue to implement Resolutions [C-05-02](#), [C-13-03](#), [C-18-03](#), presently in force.
2. Endorse the management objectives for North Pacific albacore tuna developed and agreed by the ISC MSE process, ensuring their prioritising, ranking and weighting in the context of that ongoing process.

Discussion:

- The **United States** noted that the staff recommendations are for 2 years, however the ISC—responsible for undertaking the northern albacore stock assessment—recommendations are for 1-year. They suggested that the duration of recommendation be decided by the Commission.

SAC recommendation

- The SAC approved the first draft SAC recommendation on continuation of existing measures for Pacific bluefin tuna and North Pacific albacore without substantive change, following a couple of edits relating to the nature of the recommendations being given.
- The **United States** introduced a draft recommendation regarding Commission endorsement of management objectives for North Pacific albacore developed and agreed under the ISC MSE process. This proposal was endorsed without substantive change.

7. OTHER BUSINESS

No other business was discussed.

8. ADJOURNMENT

The meeting was adjourned on 28 October 2020.